

What is claimed is:

1 1. A display apparatus for displaying an image on a display
2 device which includes rows of pixels, each pixel composed of
3 three sub-pixels that align in a lengthwise direction of the
4 pixel rows and emit light of three primary colors respectively,
5 the display apparatus comprising:

6 a front image storage unit operable to store color values
7 of sub-pixels that constitute a front image to be displayed on
8 the display device;

9 a calculation unit operable to calculate a dissimilarity
10 level of a target sub-pixel to one or more sub-pixels that are
11 adjacent to the target sub-pixel in the lengthwise direction
12 of the pixel rows, from color values of first-target-range
13 sub-pixels composed of the target sub-pixel and the one or more
14 adjacent sub-pixels stored in the front image storage unit;

15 a superimposing unit operable to generate, from color
16 values of the front image stored in the front image storage unit
17 and color values of an image currently displayed on the display
18 device, color values of sub-pixels constituting a composite image
19 of the front image and the currently displayed image;

20 a filtering unit operable to smooth out color values of
21 second-target-range sub-pixels of the composite image that
22 correspond to the first-target-range sub-pixels, by assigning
23 weights, which are determined in accordance with the
24 dissimilarity level, to the second-target-range sub-pixels; and

25 a displaying unit operable to display the composite image
26 based on the color values thereof after the smoothing out.

1 2. The display apparatus of Claim 1, wherein
2 the calculation unit calculates a temporary dissimilarity
3 level for each combination of the first-target-range sub-pixels,
4 from color values of the first-target-range sub-pixels, and
5 regards a largest temporary dissimilarity level among results
6 of the calculation to be the dissimilarity level.

1 3. The display apparatus of Claim 2, wherein
2 the first-target-range sub-pixels and the
3 second-target-range sub-pixels are identical with each other
4 in number and positions in the display device.

1 4. The display apparatus of Claim 1, wherein
2 the filtering unit performs the smoothing out of the
3 second-target-range sub-pixels if the dissimilarity level
4 calculated by the calculation unit is greater than a
5 predetermined threshold value, and does not perform the smoothing
6 out if the calculated dissimilarity level is no greater than
7 the predetermined threshold value.

1 5. A display apparatus for displaying an image on a display
2 device which includes rows of pixels, each pixel composed of
3 three sub-pixels that align in a lengthwise direction of the
4 pixel rows and emit light of three primary colors respectively,
5 the display apparatus comprising:
6 a front image storage unit operable to store color values
7 and transparency values of sub-pixels that constitute a front

8 image to be displayed on the display device, where the
9 transparency values indicate degrees of transparency of
10 sub-pixels of the front image when the front image is superimposed
11 on an image currently displayed on the display device;

12 a calculation unit operable to calculate a dissimilarity
13 level of a target sub-pixel to one or more sub-pixels that are
14 adjacent to the target sub-pixel in the lengthwise direction
15 of the pixel rows, from at least one of (i) color values and
16 (ii) transparency values of first-target-range sub-pixels
17 composed of the target sub-pixel and the one or more adjacent
18 sub-pixels stored in the front image storage unit;

19 a superimposing unit operable to generate, from color
20 values of the front image stored in the front image storage unit
21 and color values of the image currently displayed on the display
22 device, color values of sub-pixels constituting a composite image
23 of the front image and the currently displayed image;

24 a filtering unit operable to smooth out color values of
25 second-target-range sub-pixels of the composite image that
26 correspond to the first-target-range sub-pixels, by assigning
27 weights, which are determined in accordance with the
28 dissimilarity level, to the second-target-range sub-pixels; and

29 a displaying unit operable to display the composite image
30 based on the color values thereof after the smoothing out.

1 6. The display apparatus of Claim 5, wherein
2 the calculation unit calculates a temporary dissimilarity
3 level for each combination of the first-target-range sub-pixels,

4 from at least one of (i) color values and (ii) transparency values
5 of the first-target-range sub-pixels, and regards a largest
6 temporary dissimilarity level among results of the calculation
7 to be the dissimilarity level.

1 7. The display apparatus of Claim 6, wherein
2 the first-target-range sub-pixels and the
3 second-target-range sub-pixels are identical with each other
4 in number and positions in the display device.

1 8. The display apparatus of Claim 5, wherein
2 the filtering unit performs the smoothing out of the
3 second-target-range sub-pixels if the dissimilarity level
4 calculated by the calculation unit is greater than a
5 predetermined threshold value, and does not perform the smoothing
6 out if the calculated dissimilarity level is no greater than
7 the predetermined threshold value.

1 9. A display method for displaying an image on a display
2 device which includes rows of pixels, each pixel composed of
3 three sub-pixels that align in a lengthwise direction of the
4 pixel rows and emit light of three primary colors respectively,
5 the display method comprising:

6 a front image acquiring step for acquiring color values
7 of first-target-range sub-pixels composed of a target sub-pixel
8 and one or more sub-pixels that are adjacent to the target
9 sub-pixel in the lengthwise direction of the pixel rows, the

10 first-target-range sub-pixels are included in sub-pixels that
11 constitute a front image to be displayed on the display device;
12 a calculation step for calculating a dissimilarity level
13 of the target sub-pixel to the one or more sub-pixels, from the
14 color values of the first-target-range sub-pixels acquired in
15 the front image acquiring step;
16 a superimposing step for generating, from the color values
17 of the front image acquired in the front image acquiring step
18 and color values of an image currently displayed on the display
19 device, color values of sub-pixels constituting a composite image
20 of the front image and the currently displayed image;
21 a filtering step for smoothing out color values of
22 second-target-range sub-pixels of the composite image that
23 correspond to the first-target-range sub-pixels, by assigning
24 weights, which are determined in accordance with the
25 dissimilarity level, to the second-target-range sub-pixels; and
26 a displaying step for displaying the composite image based
27 on the color values thereof after the smoothing out.

1 10. A display method for displaying an image on a display
2 device which includes rows of pixels, each pixel composed of
3 three sub-pixels that align in a lengthwise direction of the
4 pixel rows and emit light of three primary colors respectively,
5 the display method comprising:

6 a front image acquiring step for acquiring color values
7 and transparency values of first-target-range sub-pixels
8 composed of a target sub-pixel and one or more sub-pixels that

9 are adjacent to the target sub-pixel in the lengthwise direction
10 of the pixel rows, the first-target-range sub-pixels are included
11 in sub-pixels that constitute a front image to be displayed on
12 the display device, where the transparency values indicate
13 degrees of transparency of sub-pixels of the front image when
14 the front image is superimposed on an image currently displayed
15 on the display device;

16 a calculation step for calculating a dissimilarity level
17 of the target sub-pixel to the one or more sub-pixels, from at
18 least one of the (i) color values and (ii) transparency values
19 of the first-target-range sub-pixels acquired in the front image
20 acquiring step;

21 a superimposing step for generating, from the color values
22 of the front image acquired in the front image acquiring step
23 and color values of the currently displayed image, color values
24 of sub-pixels constituting a composite image of the front image
25 and the currently displayed image;

26 a filtering step for smoothing out color values of
27 second-target-range sub-pixels of the composite image that
28 correspond to the first-target-range sub-pixels, by assigning
29 weights, which are determined in accordance with the
30 dissimilarity level, to the second-target-range sub-pixels; and

31 a displaying step for displaying the composite image based
32 on the color values thereof after the smoothing out.

1 11. A display program for displaying an image on a display
2 device which includes rows of pixels, each pixel composed of

3 three sub-pixels that align in a lengthwise direction of the
4 pixel rows and emit light of three primary colors respectively,
5 the display program causing a computer to execute:

6 a front image acquiring step for acquiring color values
7 of first-target-range sub-pixels composed of a target sub-pixel
8 and one or more sub-pixels that are adjacent to the target
9 sub-pixel in the lengthwise direction of the pixel rows, the
10 first-target-range sub-pixels are included in sub-pixels that
11 constitute a front image to be displayed on the display device;

12 a calculation step for calculating a dissimilarity level
13 of the target sub-pixel to the one or more sub-pixels, from the
14 color values of the first-target-range sub-pixels acquired in
15 the front image acquiring step;

16 a superimposing step for generating, from the color values
17 of the front image acquired in the front image acquiring step
18 and color values of an image currently displayed on the display
19 device, color values of sub-pixels constituting a composite image
20 of the front image and the currently displayed image;

21 a filtering step for smoothing out color values of
22 second-target-range sub-pixels of the composite image that
23 correspond to the first-target-range sub-pixels, by assigning
24 weights, which are determined in accordance with the
25 dissimilarity level, to the second-target-range sub-pixels; and

26 a displaying step for displaying the composite image based
27 on the color values thereof after the smoothing out.

1 12. A display program for displaying an image on a display

2 device which includes rows of pixels, each pixel composed of
3 three sub-pixels that align in a lengthwise direction of the
4 pixel rows and emit light of three primary colors respectively,
5 the display program causing a computer to execute:

6 a front image acquiring step for acquiring color values
7 and transparency values of first-target-range sub-pixels
8 composed of a target sub-pixel and one or more sub-pixels that
9 are adjacent to the target sub-pixel in the lengthwise direction
10 of the pixel rows, the first-target-range sub-pixels are included
11 in sub-pixels that constitute a front image to be displayed on
12 the display device, where the transparency values indicate
13 degrees of transparency of sub-pixels of the front image when
14 the front image is superimposed on an image currently displayed
15 on the display device;

16 a calculation step for calculating a dissimilarity level
17 of the target sub-pixel to the one or more sub-pixels, from at
18 least one of the (i) color values and (ii) transparency values
19 of the first-target-range sub-pixels acquired in the front image
20 acquiring step;

21 a superimposing step for generating, from the color values
22 of the front image acquired in the front image acquiring step
23 and color values of the currently displayed image, color values
24 of sub-pixels constituting a composite image of the front image
25 and the currently displayed image;

26 a filtering step for smoothing out color values of
27 second-target-range sub-pixels of the composite image that
28 correspond to the first-target-range sub-pixels, by assigning

29 weights, which are determined in accordance with the
30 dissimilarity level, to the second-target-range sub-pixels; and
31 a displaying step for displaying the composite image based
32 on the color values thereof after the smoothing out.